



Best Practice Guidelines for Burning Management

Why is Controlled Burning of Heather Carried out?

Uncontrolled burning can kill nesting birds including birds like the curlew which has been lost from huge areas of Ireland. It can destroy other species and habitats, damage commercial forestry and leave areas unsuitable for grazing for a long period of time. In contrast, controlled burning, in liaison with the conservation authorities and local fire service personnel, has a role to play in the management of the Irish uplands, in combination with appropriate livestock grazing.

The aim of controlled rotational burning is to create a mosaic or patchwork of different ages of heather and habitat structures across an area of ground. The definition of rotational burning is simply that an area of heather that has been burnt should not be re-burnt until the same area has regenerated and grown to such an extent that it is at the same height it was immediately prior to burning. This can vary from 12 to 20 years depending on a variety of factors such as growing condition, vegetation burnt, climate, aspect of area burnt *et cetera*. Uncontrolled and unplanned burning can result in a monoculture of more dominant, stagnant vegetation types over large areas.

For Biodiversity

Controlled burning causes the regeneration of heather and the intention should never be to permanently remove the plant. Regeneration is generally from the root in the case of younger heather and from the seed bed in the case of older heather. A cooler fire (which should leave mosses, bryophytes and lichens intact) will result in the regeneration of new shoots from the plant itself and a slightly hotter (but not so hot that the peat layer is burnt) fire will result in regeneration from the seed bed which accumulates year on year with in the basil mat layer.

Burning should not be carried out in blanket bog habitat in any circumstances, and in humid mires or in wet heaths, if this could lead to damage to the moss layer or the peat itself. Severe burns in wet heath can lead to a dominance of species-poor stands of Purple Moor Grass (*Molina caerulea*), which is not desirable. Species listed in the Flora Protection Order or in Annex 2 of the Habitats Directive should be considered, and habitat considerations should also be to the fore before embarking on a planned burn and the objective should always be to return the habitat to its pre-burn condition in a reasonable time frame.

Ground nesting birds can benefit from controlled burning. The three species below require different ages and structures of heather and the management of the habitats they depend on can affect their presence and abundance.

Hen Harrier

- Nests in the middle of stands of older mature and degenerate heather
- Hunts the edges and fringes between the building (shorter) and mature (longer) heather
- Feeds on prey species that depend on active habitat management

Red Grouse

- Nests in the edges and fringes of mature and building heather
- Feeds on nutritious pioneer and building ling heather (90% of red grouse diet is heather)
- Requires shorter heather for forage and to dry off and longer heather for shelter and to avoid being predated

Golden Plover

- Nests in pioneer heather or in the centre of a recently burned area offering 360° vision
- Receives shelter in mature heather
- Feeds on insects in and around wet flushes and in short heather, as it has a short beak

Insert 1: Red Grouse Management

Ling heather (*Calluna vulgaris*) is the staple diet of Red Grouse. The carrying capacity of any habitat is related to the nutritive value of the heather and also the cover it provides. Heather grows through four distinct age classes known as; Pioneer, Building, Mature and Degenerate. A balance of these age classes is necessary if a Red Grouse population is to become sustainable, and if this is the management objective. The edible parts of heather are the green shoots and to a lesser extent the flowers and seed capsules. Young heather in the pioneer phase, one to two years after burning or cutting, has a nitrogen and phosphorous content more than twice that of 10-year old plants in the mid building phase. The food quality of heather degenerates further in the mature and degenerate phases.

In general, Red Grouse require tall heather for shelter or nesting (20-30cm) and prefer 10-30cm heather for foraging. Hens usually nest in mature heather adjacent to freshly cut/burnt or second year cut/burnt heather, where fresh shoots will be available for chicks. This improved microclimate is beneficial to the reproduction of invertebrates which are a vital food source for chicks. Essentially, the quality and age diversity of heather will largely dictate the distribution and density of the associated Red Grouse population. A patchwork of old and new heather is widely considered as the best management practise for Red Grouse.

Grazing / Farming Interests

Controlled burning of heather may be a legitimate additional management tool for farmers or managers wishing to provide grazing for domesticated herbivores such as sheep. It is essential that if controlled burning is used as a management tool that it be carried out in conjunction with an appropriate grazing regime. Heather is eaten by sheep when their favoured grass species are either exhausted or die back for the winter.

By creating a mosaic of different ages and lengths of heather, sheep can be attracted to new areas within a site being managed through the use of controlled burning. Many commonage farmers do not have the time to actively shepherd or heft (move) their flocks around due to

time constraints and the practice of 'shepherding through burning' may be beneficial. By encouraging sheep to move to freshly burnt areas which offer 'sweet' nutritious grasses, sheep are less likely to congregate in habitats favoured by ticks such as rushes, long degenerate heather or bracken.

The advantage of having many smaller burnt and regenerating areas rather than one large burnt area is that the sheep will not remain in a single area, which would cause the ground to be poached or overgrazed. This movement of sheep in turn helps prevent foot rot which can occur in damper, poached areas of ground.

The general health of sheep is considered better where there is a movement of stock. Worm infestations are lower as sheep will not defecate in solely on one area of ground. Instead they will move to new areas to find fresh feeding resulting from controlled burning.

Fuel Reduction

A further reason for considering carrying out controlled burning of heather is to use the management tool as a means of "fuel reduction" and therefore help in the prevention of uncontrolled wildfire. Without the patches of burnt and regenerating heather which act as natural firebreaks the swath would be generally of one universal height, which in turn is hard to extinguish without the presence of breaks in vegetation.

How is controlled burning carried out?

Burning small patches of heather at regular intervals can be used as a management tool to maintain heather in a phase when the biomass of young nutritious shoots is at a maximum, and to create a diversity of heather structure. It should be noted that heather regenerates more successfully after autumn fires.

Insert 2: Heather regeneration

From seed: Up to 100,000 seeds are produced per plant and in the order of one million per square metre in the season. The seeds are shed in the autumn and retain their viability in damp soil or litter for up to 10 years. Fluctuating temperatures and exposure to light, as in the area cleared by burning, stimulates germination. A fire may destroy seeds on the surface but many that lie buried survive.

From buds: With grazing or cutting which removes only part of the branch system, shoots may sprout from several levels. After burning, a dense cluster of shoots develops from dormant buds near the base of the stems. Regeneration after burning is best when the branches have had six to ten year's growth and declines to a minimum in the degenerate phase.

Layering: This occurs in the degenerate phase. Adventitious roots and new shoots develop when collapsed branches lie prostrate among damp peat and moss. The heather may return to a relatively young phase, but the regeneration cycle will exceed 25 years, usually much longer than from seed or after burning.

Heather regeneration can also be encouraged by cutting with brush cutter, a swipe, a flail or forage harvester. The litter if collected in the autumn, provides a source of heather seed for reseeding areas which have lost their heather cover in a severe burn or as a result of severe grazing. Cutting can also be used to create firebreaks or to assist livestock into deeper vegetation.

Best practice in heather burning has been researched and developed in other jurisdictions.

Key elements of this include:

- When managing for sheep and Red Grouse, burning should be carried out when the heather is 20-30cm high, but patches should be allowed to grow to 40cm as nesting and roosting cover.
- The interval since the last burn on a particular patch should be between 12-20 years.

- The fire should be hot enough to consume most of the heather above ground, but not kill the basal buds and rootstock, nor destroy the seed bank or burn the peat. Regeneration can therefore take place either from seed or vegetatively.
- Burning is usually down-wind, but if a hotter fire is required to remove old woody stems, slower back-burning into the wind is practiced. It is also best to burn across and down the slope.
- To provide a mosaic of different aged heather for both food and cover, it is desirable to have many small burns of 0.5 –1.0 ha in extent rather than large extensive ones. The heather should ideally be burnt in strips no more than 30 metres wide and up to 150 metres in length. Burning should be parallel to a previous burn, but not using its entire length.
- Blanket bog, steep slopes and other areas unsuitable for burning (including potentially wet heath) should remain unburnt to encourage greater habitat diversity.

How to light and control a fire?

In order to understand how to light and control a fire, the characteristics of fire need to be understood and in particular how it is fed, travels and regenerates. The best way to understand this is to experience controlled burning at first hand in the company of an experienced operative.

Insert 3: Key terms in the discussion of controlled burning include

Ignition point – Where the fire is lit and the Face established

Face fire – Hot, glowing front of fire

Back fire – Fire burning against the direction of the wind

Fringe fire – Edges of the burnt area still burning left as the Face progresses

Fingering fire – Smaller fires resulting from the Face breaking up

Fire break – Where the fire stops if it is not manually extinguished

When a fire is lit and allowed to travel with the wind, however large or small, it will naturally take the shape of an egg. This is due to the initial Face that was lit widening as the wind powers it forward and the fire seeks the oxygen it needs to continue burning. If left entirely to its own devices the Fringe fires would take oxygen from the Face and the two sides of the Face would compete for the same oxygen and the fire's Face would narrow and eventually come to a point.

The characteristic cone shape of a wildfire travelling up hill is due to the Face travelling with such speed (due to wind and the fact that fire is drawn burning fuel and using oxygen as it travels) that the Face is too far from the Fringes and the edges of the Face too far apart to be drawn together. When the Face loses wind to drive it, it breaks up in to Finger fires which can either then be extinguished individually or which burn themselves out as they use up oxygen and fuel resources.

How then does a practitioner of controlled burning prevent a fire from forming either an egg or a cone shape but rather the controlled strip fire of a desired certain width and length?

In order to achieve this goal, an understanding of fire behaviour and wind is essential. No wind is ever true and no wind is ever directly behind the Face of the fire. Rather, a wind that is driving the Face of the fire will always drive the Face more on a given side periodically, which will then alternate and cause the Face to widen. The following points should allow one to successfully control a fire, prevent it from widening and steer the Face in such a way that it is then extinguishable.

1. Ensure that all necessary insurances are in place.
2. Select the area of heather to be burnt.
3. Ensure there are two suitable fire breaks (A and B) at which the fire can be halted if it has not been extinguished prior to reaching them. Fire break B is there in the event of the fire jumping Fire break A.

4. Choose an Ignition point and establish a Face with the wind behind the fire Face. A fire with a single Face is far easier to control than one made up of lots of individual fires.
5. When establishing the Face of the fire that is expected to be 30 metres in width at its widest point the initial Face should be no wider than 20 metres as it will widen even when being controlled.
6. Once the Face has been established allow the Face to travel, driven by the wind, a small distance. What is left behind at the original Ignition point are Back fires which will burn against the direction of the wind.
7. Back fires should all be extinguished in case of a change in wind direction which could lead to the establishment of a second fire and also due to the smoke from Back fires being a hindrance to those working at controlling the fire. Although the Back fires burn against the wind the smoke from them will travel with the wind.
8. As the Face of the fire progresses the edge or Fringe fires will remain on either side. These can be differentiated from the Face of the fire as they are not as hot as the glowing Face and they flicker upwards and do not progress as the Face does. These should always be extinguished. Always look behind when working at or near the Face in case Fringe fires have reignited as they can, at worst, develop into a second Face fire that can trap personnel between two fires, and at best, make it hard to see.
9. Those charged with extinguishing the Fringe fires should stay as close to the Face fire as the heat permits in order to prevent it from widening, once it has reached its desired width, and to narrow it / maintain its width as it progresses. This is in effect how the Face is steered in a desired direction.
10. When extinguishing the Fringe fires and controlling the Face fire, a knowledge of wind behaviour is essential as no wind is true and never directly behind the Face of the fire that it is driving. As the wind comes slightly from the right hand side the left hand side of the fire will be the 'hotter' side and the right the 'cooler'. The left hand side will therefore progress more rapidly and need more attention and hence more personnel. This will be reversed as the wind comes slightly from the left hand side and some personnel will need to be moved to the right hand side. This constant oscillation of the wind will continue for as long as the fire burns.

11. When it is deemed that the fire is to be extinguished prior to reaching a Fire break both teams of personnel on either side of the fire should ensure any Fringe fires still burning are extinguished bringing them to the hottest part of the fire – the Face – which should be narrowed to the point that both teams ‘meet in the middle’. This is the hottest part of carrying out controlled burning and all should be instructed to have more personnel on the ‘hotter’ side but also be prepared to swap back and forth.

DRAFT

Keep in touch with the Face fire

Extinguish all Back and Fringe fires

Every fire will behave differently

Place more personnel on the 'hotter' side

Study the fire as it progresses

Always have two Fire breaks

Fire is an entity that feeds, breaths, moves and reproduces

Extinguish all fire before lighting another one

Satisfying Legal Requirements

Under Section 40 of the Wildlife Acts and Section 7 of the Heritage Act 2018, burning in the State is allowed between 1 September and the end of February and in the month of March in certain parts of the country as designated by the Minister for Culture, Heritage and the Gaeltacht under Regulation. Burning within 1 mile of a forest is restricted under Section 39 of the Wildlife Act. In accordance with the requirements of this section, written notice must be given of any proposed burning, at least 7 days in advance, to the District Garda Sergeant and to Coillte. All SACs selected for heath or bog, burning and cutting are subject to Notifiable Actions or Activities Requiring Consent and the Minister of Culture, Heritage and the Gaeltacht must formally approve (ie carry out a screening assessment) of any such action beforehand, unless the activity is covered under an approved plan administered by another Department or agency, such as planned burning in a Commonage Management Plan under GLAS and administered by the Department of Agriculture, Food and the Marine, who in these circumstances would carry out the screening assessment.

The Health and Safety Authority advise that planned burning of vegetation should only be carried out by appropriate personnel, with training, knowledge and expertise in managing safe and controlled operations. They also require that burning only take place in accordance with a written burning plan that takes account the Department of Agriculture, Food and the Marine Prescribed Burning Code of Practice.

Anyone planning burning should ensure that suitable and adequate insurance cover is acquired for the task. Employer's Liability insurance, if relevant, should be checked to determine if prescribed burning activity is covered, in particular if employees or sub-contractors are likely to be involved. The Safety, Health and Welfare at Work Act 2005 and Regulations 2007 emphasise that hazard/risk assessment is a core element of health and safety management in places of work.

Heather Management using burning within Natura 2000 sites and NHAs

Natura 2000 sites include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Natural Heritage Areas are national designations for blanket bog and raised bog.

Hill sheep farmers and conservation managers anxious to maintain or restore the quality of farmed habitats, on both designated and undesignated areas, generally agree that some controlled burning may be useful, especially where grazing levels have been reduced. Rank, woody and degenerating heather is of little nutritional value to sheep and may gradually suppress the wider botanical and ornithological value of such sites. In order to maintain heather quality, burning and possibly mechanical strimming may be appropriate management, in addition to grazing, if rank heather is to be avoided.

There is a legal requirement for the State to maintain, or restore as appropriate, the qualifying interests or species of conservation interest (selected habitats and species of European importance, including birds) in Natura 2000 sites to favourable conservation condition. Therefore the conservation objectives for the site in question should always be consulted. An example of the site specific conservation objectives for European Dry Heaths (4030) is available for Three Castle Head to Mizen Head SAC (000109) on the [NPWS website](#). These objectives include attributes, measures and targets for this protected habitat, which should be considered carefully in advance of any planned burning. A general target for all

Annexed habitat is to maintain the area of the habitat in question as “stable or increasing”. Therefore any burning event that would impact on the achievement of this target should not proceed. Wet heaths, Blanket bogs and Rhynchosporion depressions in SACs have targets relating to there being no signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning and no signs of burning in sensitive areas.

Important considerations before burning in a Natura 2000 site

Controlled burning of heather done at the right time of year, in the right place, in the correct way, may be an effective method of habitat management if the appropriate considerations and controls are put in place. Lighting the fire is the easy part, but controlling the fire is what requires skill, practice and knowledge.

There are issues to consider when it comes to the use of controlled burning for managing heather – the land itself being one of the most important. Is the area that is to be burnt designated? Article 6.3 of the EU Habitats Directive states that where a plan or project is likely to have a significant negative impact on a Natura 2000 site, then this cannot proceed except in very limited circumstances. To enable a determination to be made by DCHG or DAFM, all the available information should be collated in advance to enable a screening assessment to be undertaken. In certain circumstances, a Natura Impact Statement may be requested from the applicant, if it is deemed that an Appropriate Assessment (AA) is required to determine the likely effect of the burning activity.

Insert 5: What has been the experience of heather management on the Boleybrack Red Grouse Project?

Boleybrack Mountain is located north of Lough Allen and lies between the towns of Drumkeeran, Manorhamilton and Blacklion in North Leitrim. A large portion of the northern side of the mountain overlooks the parish of Glenfarne. Boleybrack Mountain comprises an extensive upland plateau, dominated by mountain blanket bog and wet heath, with small lakes scattered throughout. There are low rocky cliffs, areas of dry heath and a variety of grass types. Most of Boleybrack Mountain is designated as a Special Area of Conservation (SAC) under the EU Habitats Directive.

Through the planned, controlled and appropriate management of dry heath by means of burning and grazing, the Boleybrack Mountain Red Grouse Habitat Management Project has managed a significant increase in the population of Red Grouse on the site. 108 pairs of Red Grouse were counted in January-February 2014 using a tape-lure survey. On Boleybrack, there are currently 12.7 birds per km² in comparison to 1.1 birds per km² elsewhere in Ireland (National Red Grouse Survey 2006-2008). The management also creates favourable ecological conditions for the habitats that are selected as conservation interests in the site and for a range of other species including Annex 1 species such as Hen Harrier, Golden Plover and Merlin. Other species of conservation concern using the project site include Peregrine Falcon, Golden Eagle and Buzzard as well as Skylark, Wheatear, Meadow Pipit, to name but a few.

Necessary Steps Notifications prior to Burning

The following steps should be undertaken prior to burning

1. Determine the date of the planned burning event. If this is outside the current Section 40 closed period (September to February inclusive, and those parts of the country designated by the minister for Culture, Heritage and the Gaeltacht for burning in March), then burning can proceed in the normal way, subject to ensuring compliance with all other national requirements and consents (including the permissions of other commonage shareholders as relevant).
2. If the burning is proposed in a Natura 2000 or NHA designated site, then the screening will be carried out by DCHG or DAFM¹, as appropriate, and should be accompanied by a “notifiable action” or “activity requiring consent” form (addressed to DAHRRGA) or a CMP (addressed to DAFM) which contains the planned burning information. Burning should not take place prior to the approval by the relevant Department.
3. Burning should only be carried out by trained and experienced operatives. There should be procedures for the controlled burning of heather in accordance with the guidelines provided above.
4. Coillte or adjacent private forest holders within 1 mile of the planned burning event should also receive a copy of the “burn plan” 7 days in advance.
5. Arrangements should be made for notification of the Garda Síochána just before burning starts, and at least 7 days in advance in the case of 1 mile proximity to forest areas.

¹ DAFM will undertake screening for planned burning as part of a GLAS plan in a Natura 2000 site

Additional Reading and Reference Material

[Department of Environment, Food and Agriculture \(2010\). The Heath Burning Code. Isle of Man Government.](#)

[Forest Service, 2012. Prescribed Burning Code of Practice - Ireland. Department of Agriculture, Food and the Marine, Dublin](#)

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[Nugent and Casey, 2014. Nugent, Ciaran and J Casey. Prescribed Fire as a land Management Tool in the Irish Uplands. In Proceedings of National Sheep Conference 28th January 2014, Bantry, Co. Cork. Teagasc 2014](#)

[Prescribed Burning on Moorland, Supplement to the Muirburn Code: A Guide to best practice \(2001\). Scottish Executive](#)

[The Heather Burning and Grass Code Version 2007. Department for Environment, Food and Rural Affairs.](#)

[The Heather Burning and Grass Code Version 2007, Best Practice Guide 1: How to produce a Burning Plan. Department for Environment, Food and Rural Affairs.](#)

[The Heather Burning and Grass Code Version 2007, Best Practice Guide 3: Identifying Sensitive Areas. Department for Environment, Food and Rural Affairs.](#)

[The Muirburn Code \(2011\). The Scottish Government, Edinburgh.](#)

[Rebane, M., Backshall, J., Manley, J. and English Nature \(2001\). *The upland management handbook*. English Nature, Peterborough.](#)



Select area to burn



Ignition point



Ignition point



Establishing fire face 1



Establishing fire face 2



Establishing fire face 3



Establishing fire face 4



Establishing fire face 5



Fire face established 1



Fire face established 2



Fire face established 3



Back fires burning



Studying a fringe fire



Steering a face fire



Studying a fire



Extinguish



Fringe fire - extinguish



Studying a fire



Fringe fire – extinguish



Waiting for reignition



Waiting for reignition